teen years within the experience of the present manager. During the whole of that time no blasting had ever been done in any intake air-way. On the 2nd of October last, however, a party of men were instructed to blast away a portion of the side of the west chain road at a distance of about 550 yards from the bottom of the shaft. They fired three shots in all, and the third caused the explosion. It was not a blown-out shot in any sense.

The mechanical effects were exactly the same as those produced by other explosions. Timber was torn out, and falls of roof sometimes of great magnitude and extent were caused all through the intake air-ways, as far as the flame reached. In the endless chain roads the box part of each empty tub was swept away from the frame, and shattered into small pieces, not one being left whole. A spare pulley-wheel, 4 feet in diameter and weighing 15 cwt., which had been standing on its edge leaning against the side near the end of the west chain road, was carried four yards inwards towards the face, and laid flat on its side.

The flame traversed all the intake air-ways, except the new east road, and died out in some nearer to, and in others further from, the faces. It did not in any case pass into a return air-way. It did not reach the face of the workings at any point.

The new east road was quite undisturbed. Two men who were working in it felt a concussion of the air, but saw no flame, and came out unscathed. This result appears to be due entirely to the circumstance that the principal stables were ranged along the entrance to this road, and the ground having been kept constantly wet with the water used in the service of the horses, the flame was unable to pass that point for want of coal-dust to sustain it.

II. "Second Note on the Geometrical Construction of the Cell of the Honey Bee ('Roy. Soc. Proc.,' vol. 39, p. 253, and vol. 41, p. 442)." By Professor H. Hennessy, F.R.S. Received February 21, 1887.

If from the intersections of the diagonals of the three lozenges forming the apex of the cell, perpendiculars be erected, these will meet at a point on the cell's axis, and each of them is manifestly the radius of a sphere tangent to the three lozenges. A plane passing through a radius and the axis passes through the short diagonal, e, of the lozenge whose length is $h\sqrt{(3/2)}$; using the notation and results of the paper above cited.

The distance intercepted on the axis by a perpendicular let fall from the middle of the lozenge is equal to $x = h/(2\sqrt{2})$, and as this

perpendicular is manifestly equal to $\sqrt{(\frac{1}{4}e^2 - x^2)}$, and as we have evidently—

$$\frac{r}{\sqrt{(\frac{1}{4}e^2-x^2)}} = \frac{e}{2x}, \qquad \text{we obtain} \qquad r = \tfrac{1}{2}h\sqrt{3}.$$

But $h\sqrt{3}$ is a diameter of the hexagonal prism perpendicular to two of its opposite faces; hence a sphere may be inscribed within the cell from a point measured from the vertex at a distance equal to the side of one of the lozenges, and with a radius equal to half the long diagonal of this lozenge, while another sphere with a diameter equal to three times the side of the lozenge circumscribes the triangular pyramid at the summit.

The diameter D′ of the inscribed sphere is equal to the diameter of the cell, while the diameter D of the exterior sphere is equal to the sum of three edges of the pyramid, and it therefore follows from the first note, vol. 41, that between these diameters we have the expression—

$$\frac{D}{D'} = \left(\frac{3}{2}\right)^{\frac{3}{2}}.$$

The relation between the geometrical cell and the interior and exterior spheres whose diameters are connected by this equation may possibly have some bearing on the question of the formation of the actual cells.

III. "The Embryology of Monotremata and Marsupialia. Part I." By W. H. CALDWELL, M.A., Fellow of Gonville and Caius College, Cambridge. Communicated by Prof. M. FOSTER, Sec. R.S. Received February 22, 1887.

(Abstract.)*

1. *The Egg-membranes.*

In Monotremata, in very young ova, a fine membrane exists between the single row of follicular cells and the substance of the ovum. This membrane, which I will call *the vitelline membrane*, at first increases in thickness with the growth of the ovum, and through it pass numerous fine protoplasmic processes connecting the protoplasm of the follicular cells with that of the ovum, and serving to conduct food granules, which, appearing in the neighbourhood of the nuclei of the

* The author being at the present time in Australia and so unable to correct the proof of this abstract, I have undertaken this duty. In doing so I have ventured, for the sake of what appeared to be increased clearness, to introduce into § 1 some modifications of the author's manuscript, being guided therein by the author's more detailed account given in the fuller paper.—M. FOSTER, Sec. R.S.